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Institutional Innovations For Sustainable Mobility: Comparing Groningen (NL) and Phoenix (US)

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Abstract

The pursuit of sustainable mobility requires a process of innovations for spatial planning policies. This process is widely sought after in different cities and regions. However, the necessary conditions are not explicitly identified. By comparing the cases of Groningen, the Netherlands and Phoenix, AZ, US; the authors seek key conditions allowing innovations for sustainable mobility. Through a historiography of key moments within these processes, interviews with key experts and a qualitative data analysis of policy documents; the authors identify the key conditions as i) appropriate governance and ii) presence of complementary institutions. Additionally, the presence of coalitions (bottom-up initiatives, local activist or lobby groups) contributes a surprisingly crucial and tangible role in the shift towards sustainable mobility.

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Keywords: sustainable mobility; institutional innovations; collaborative planning; Groningen; Phoenix, Arizona

1. The pursuit of sustainable mobility

The pursuit of sustainable mobility still dominates policy discussions and strategies (e.g. from the EU Common Transportation Policy to current EU SUMP Guidelines) seeking a more sustainable built environment and ways of meeting mobility needs in many cities and regions. Here, the main aim of sustainable mobility is 'to contribute to social and economic welfare, without damaging the environment or depleting environmental resources' (Nykvist and

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Whitmarsh, 2008, p.1373). The popular policies and strategies can range from a focus on slow modes such as cycling plans or walkability studies to emission reductions or even going car-free (e.g. recent car free mobility plans of Ghent, Belgium).

Although the goal of sustainable mobility has been well defined, the conditions for a 'successful' shift towards implementing sustainable mobility are not always understood even though conditions for sustainable mobility are discussed in detail (Banister, 2008; Greene & Wegener, 1997; Nykvist & Whitmarsh, 2008; Vergragt & Brown, 2007). Many authors have however identified barriers for implementation (Banister, 1996, 2005a; Clifford et al., 2005; Hull, 2008; Rietveld and Stough, 2005). Banister (2005a, p. 54) defines these barriers as the 'policy behavior gap' in which 'the gap between the assumptions underlying policy measures on the one hand, and the behavioral by individuals on the other'.

The initial wave can be traced to the 1970s, in which a focus was placed on limiting the amount of car based trips made in conjunction with shifting towards cleaner modes of transport such as cycling and public transit (Banister, 1996; 2008). Subsequent discussions on sustainable mobility follows in two streams: i) reducing environmental impact through technological innovations such as: new fuel types or limiting emission, or ii) behavioral change through institutional innovations as defined by deliberate change in policies and practices of spatial interventions to contribute towards sustainability goals (Tan et al, 2014a). However, there is still insufficient insights into the 'what' and 'how' of implementing innovations to achieve desired change in specific contexts (Tan et al, 2014b). Moreover, a theory-practice gap still exists between knowing what academic debates indicate are innovations, and that of practical implementation of those innovations (van Buuren & Edelenbos, 2004).

Many cities and regions in Europe, the US and Asia seeking sustainable mobility are either trying to re-invent the wheel or blindly copying best practices from elsewhere (Clifford et al., 2005; Tan, 2013). This pursuit is also coupled with a changing role of government through the devolvement of hierarchical, national planning (Savini, 2013) to more collaboration with private and local actors through new governance forms through legal or financial instruments, such as public-private partnerships and joint ventures, and organizational reforms such as bottom-up initiatives or coalitions (Boelens and Boonstra, 2011). This change in governance approaches affects and impacts upon the institutional actors and their relation with each other at once being and producing institutional innovations. The authors therefore propose to focus on exploring how institutional innovations are created and conducted in specific regions, as well as focus on the role of coalitions in the planning process towards sustainable mobility. This paper will first discuss the theoretical background used, the methodology applied, describe both cases and present the findings from the cross-case comparisons before concluding with discussions on potential policy advice.

1.1. Evolutionary approach to institutional innovations

To achieve sustainable mobility, cities and regions need evolve away from the business-as-usual model in which transport and land use are separated and the impacts of car dominated transportation are neglected, towards a more comprehensive and innovative approach to sustainable development. Here, innovations are understood not as new creations but rather improvements on the existing. As applied to spatial planning, these can take the form of improvement to practices, governance forms or even norms towards a desired goal of sustainable mobility. The manifestations of these innovations on the spatial realm are contingent of relevant institutional change and might not be immediately observable (Tan, 2013). For example, the process of moving away from a car-oriented transport policy towards more public transport and slower modes in Portland, Oregon took several institutional innovations in the form of policy and behavioral changes throughout three decades (Tan et al., 2014a; 2014b; Wheeler, 2003). Herein, the evolutionary approach to understanding transportation and land use changes (Bertolini, 2007; Pflieger et al., 2009) offers a perspective into how the necessary conditions for innovations occur and the role of specific institutional actors in this process.

This shift resulting in tangible implementation is the process of institutional change, marked through the process of institutional innovations that either act as catalysts or as a result of said change (Tan, 2013). This understanding is a

combination of evolutionary geography in conjunction with a new institutionalism approach to understanding the spatial planning processes (Kim, 2008). Some authors advocate that such a process is observable through abrupt 'critical junctures' (Buitelaar et al, 2007; Taylor, 2013) while others speak of recognizing of historical and slow-acting path dependencies (Pflieger et al., 2009; Salet and Thornely, 2007; Truffer and Coenen, 2012). The process of innovation referred to in this paper adopts both views, that there are catalytic policies and events that trigger certain cause and effects further down the timeline of spatial planning processes of certain cities and regions (Tan, 2013).

When considering the implementation of sustainable mobility through innovations, the institutional and collaborative turns in planning theory are of crucial importance as well. These paradigm shifts have ignited discussions on the institutional aspects of sustainable mobility (Clifford et al, 2008; Healey, 1998; Hull, 2008; Innes & Booher, 2004; Rietveld and Stough, 2003). This begs the questions of ***under which conditions (including barriers) could innovation for sustainable mobility occur*** within the troika of governance, institutions and observable patterns of change. This paper therefore aims to define the process of innovations in sustainable mobility by using the aforementioned trio of dimensions. In addition, it elaborates on the role that coalitions can play in this process.

Utilizing a theoretical framework combining institutional analysis and evolutionary approach to institutions, the authors propose to evaluate and understand the institutional innovation process in two separate city regions. This paper adopts the definition of institutions as "the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights)" (North, 1991, p. 97). Both formal and informal institutions must be complementary in order to affect institutional change (Tan, 2013; 2014a; 2014b). With the above definition, it becomes necessary to focus include the governance aspects in the implementation process, particularly the actors (individuals or groups) and organizations involved in these institutional fields and their collaboration or coalitions with each other (Lin, 2003). As such, the proposed framework will seek the following variables for the process of innovation;

- **Governance** – the human side of planning processes as expressed in actors, their organizations and their interactions and collaborations in coalitions.

- **Institutions** – the formal and informal rules of planning, consisting of legal and financial policies, regulations as well as social and cultural norms.

1.2. Methodology and data collection

To understand the process of innovation for sustainable mobility and given the explanatory nature of the question posed, the comparative case study method with extreme cases was selected. The comparative aspect could strengthen the external validity of the findings while the marked differences in culture, politics and planning processes contributed to the generalizability of the findings. The units of analysis would then be coalitions that have contributed or are contributing to sustainable mobility pursuits as framed through a historical reconstruction of the pursuit for sustainable mobility as understood in that specific city region.

The selection criteria for the cases were;

- An explicit will to pursue sustainable mobility had to be propagated by the local government. E.g., be willing to lift implementation barriers to indicate a change towards a more conducive context for sustainable mobility.

- A modal shift towards more sustainable forms of transport such as public transit or cycling.

- Cultural and progression differences between both cases to increase the chance of collecting a wide range of understandings and focusing on process of innovations.

The availability and accessibility of information to the authors to conduct this research was determinant in the final selection of cases. This criterion is mainly based on the willingness of actors and organizations to participate in the research. Two cases at varying stages of their pursuit of sustainable mobility were chosen; i) the starting case: Phoenix, Arizona in the United States, and ii) the established case: Groningen in the Netherlands. The stage at which each case was currently at was determined with the following:

- Initiation period of pro-active sustainable mobility pursuit,
- Level of willingness of past and current local governmental bodies to pursue innovations in sustainable mobility

Both cities had a track record of policies and plans that explicitly sought sustainable mobility but Groningen had a longer history of this. Groningen was wildly successful in affecting a modal shift while Phoenix relatively less successfully. Last but not least, the European and US planning context are disparate enough to provide for marked cultural and political differences.

The process of innovation is reconstructed through a triangulation of information through i) in-depth interviews with relevant actors (key actors from field of urban planning, sustainability initiatives and policy) to ensure diversity of views, ii) document analysis of policies, public records, news and other media and iii) observation of both cases through a fieldwork period of 8 weeks each. The choice of interviews was to collect intangible data and perspectives from the actors appropriate to the question posed whereby opinions and attitudes are important information. In addition, the interviews sought to broaden the reconstruction beyond the 'official stories' typical of policy documents. The on-site observation provided confirmation of claimed implementations and allowed the authors to attend public meetings to broaden information viewpoints.

The process of data collection was as followed. A fieldwork period of 8 weeks was preceded by a period of desktop research for both cases to collate information that could provide a basic structure of the process of innovations. Particular attention was paid to key policy documents, events and organizations with an eye to selecting key experts for the in-depth interviews, and locations for the on-site observation in each case. Interviewees encompassed academics, practitioners, policy makers, activists, politicians and coalitions to gain a balanced view. Selection of interviewees began with approaching relevant key experts and continued with snowballing. A total of 47 in-depth interviews were held (26 in Phoenix and 21 in Groningen). Observation sites were areas where infrastructure and land use improvements have occurred, such as large transit hubs, cycling networks and new urban developments.

1.3. Analysis

Given the evolutionary character of the process of innovation, the above variables of institutions and governance were highlighted in four steps for both cases. The first step is i) an introductory case description focusing on the context for land use and transport, sustainable mobility, and governance in each case. The second step is ii) a historiography in which the empirical data (key moments, documents, actors, organizations, and events) were rearranged in a coherent timeline based on the data collected. The last three steps were based on the interviews that were transcribed and coded based the following categories below:

- Governance: Collaboration & coalitions - Conditions affiliated with partnerships between actors and organizations and the emergence of coalitions.
- Governance: Actors & organizations - Key actors or organizations and conditions affiliated with characteristics and capacities among actors and organizations.
- Cultural institutions - Local political and planning culture
- Social institutions - Social habits and norms.

The next steps focused on iii) conditions and barriers to innovations in sustainable mobility. Moreover, more conditions than barriers are defined because most barriers can be seen as an 'opposite condition'. For example, after one of the interviewees indicated the condition of 'having enough funds', the barrier 'lack of funds' will not be coded unless explicitly stated. This is followed by categorizing what interviewees perceived as iv) conditions and barriers to collaboration and coalitions for their city region regarding sustainable mobility.

The case study methodology was set in a protocol (fieldwork, data collection, interview and analysis) and tested on the pilot case of Groningen, refined and then replicated on the case of Phoenix. This ensured external validity of the data collected and the findings. The analysis as stated above was applied per case and then compared across the cases. The next section will briefly describe each case and compare the findings.

2. Comparing Groningen and Phoenix

As previously stated, Groningen was the more established case while Phoenix was relatively new to the pursuit of sustainable mobility. As such, the longevity of the historiography was also affected. However, this was precisely the goal of comparing two such cases, as it was not the absolute comparison across cases but the relative change per case as compared to the other that would provide the necessary insights. The cases will be described in general and then their conditions for innovations as revealed by the five-step analysis compared.

2.1. Groningen

Groningen has an important regional economic function for its surrounding provinces (see Fig. 1) with a dense, compact city structure in which most facilities are located due to the limitations of its medieval structure. The pursuit of sustainable mobility in Groningen was triggered by the desire to increase liveability, lack of space for urban expansion and economic conditions as Groningen was underperforming in comparison to the major cities in the west of the country. The relatively stable political scene and isolation in location resulted in a favorable context for the city to pursue innovative policies. The former and current local governments are well known for leading the charge in sustainable mobility policies in the Netherlands. As shown in Table 1, there are three distinct periods observed each contributing to the process of innovations in Groningen (Homrighausen, 2015).

The sixties, particularly the later part of it, saw a new left wing city council elected and installed that embraced and gave priority to concepts of liveability instead of the established city planning doctrine of road network expansions marking the first phase of innovations (Tan and Verhoeven, 2014). The crowning achievement was the Traffic Circulation Plan (TCP) of 1977 (Tsubohara and Voogd, 2004). This plan included a wide variety of policies including placing road signs. However, the most radical and important strategy was the division of the inner city into four quadrants and thereby reducing car traffic into the city. The division also had the intended effect to make it such that the choice of travelling by car would be more inconvenient and less desirable. Cyclists and public transport users were however able to cross these quadrants, which resulted in an enormous boost for non-motorized transport in the inner city. Despite a lot of criticism at that time, this marked the first major step for sustainable mobility in planning strategies (van der Zee, 2015).

The second phase started around l989, when the integrated inner city plans, '*Binnenstad Beter'* was initiated (Gemeente Groningen, 1992). Continuing the focus on liveability, the plan expanded the car free zones in the city's inner core, though it was not as comprehensive as the TCP, as well as introduced park-and-ride facilities and free bus lanes. Its strength was in the collaboration with local businesses leading to much less criticism than the previous plans. Groningen is currently in its third phase. After plans for a tram were cancelled in 2012, the city had to focus on a new public transit system. A high quality bus network was introduced to connect the most important facilities in the city. In its wake, several coalitions focusing on economic growth, partnership, and accessibility has rose up in the past few years and large infrastructural projects have started or will start in the near future (2020) (Tan and Verhoeven, 2014;

Homrighausen, 2015). Current new innovations proposed are a bus-free inner city core and a renewed comprehensive cycling strategy. This is the result of a highly proactive local city council.

Fig. 1. Map of Groningen (scale 1:100 000)

2.2. Phoenix, AZ

The city of Phoenix, located in the desert state of Arizona, is home to just over 1.5 million inhabitants (and almost four million in its metropolitan area) (see Fig. 2). It is one of the fastest growing and most sprawled regions in the country. The reason for this outstretched design has historical roots. Phoenix began as a frontier region and with the industrial revolution in the late 19th century, when the populace sought to leave the congested Northeastern cities with a lot of them ending up in Phoenix for sun and space (Brown, 2009).

As in many other American cities, Phoenix urban pattern changed with the introduction of the automobile replacing walking and the streetcar as the main travel modes. This allowed for suburban sprawl, with cheap land being in reach of facilities in the cities by car (Keys et al., 2008). Phoenix is part of the Valley of the Sun agglomeration with 27 other cities that are strongly intertwined. This complex relationship is also reflected in the legislative bodies that govern this area: the federal government (the United States of America), state (Arizona), county (Maricopa County), and the cities (Guhathakurta and Stimson, 2007). The pursuit of sustainable mobility is a recent policy narrative strongly tied to sustainable development, triggered by Phoenix's location within an unproductive desert and urgent issues including water depletion (Iwaniec and Wiek, 2014). In addition, the issue gas dependency and the price of additional infrastructure play a part.

The streetcar network development from the late 1800s was a starting point but since then, there have been no further initiatives. 20th century Phoenix was typical example of urban sprawl, automobile dependency and homogenous land use (Kane et al, 2014). In recent years, however, several innovations such as the light rail (2008)

and sustainability committees (2011) have created a more conducive context in Phoenix. In fact, the research shows Phoenix at the cusp of an innovation process (also see Table 1).

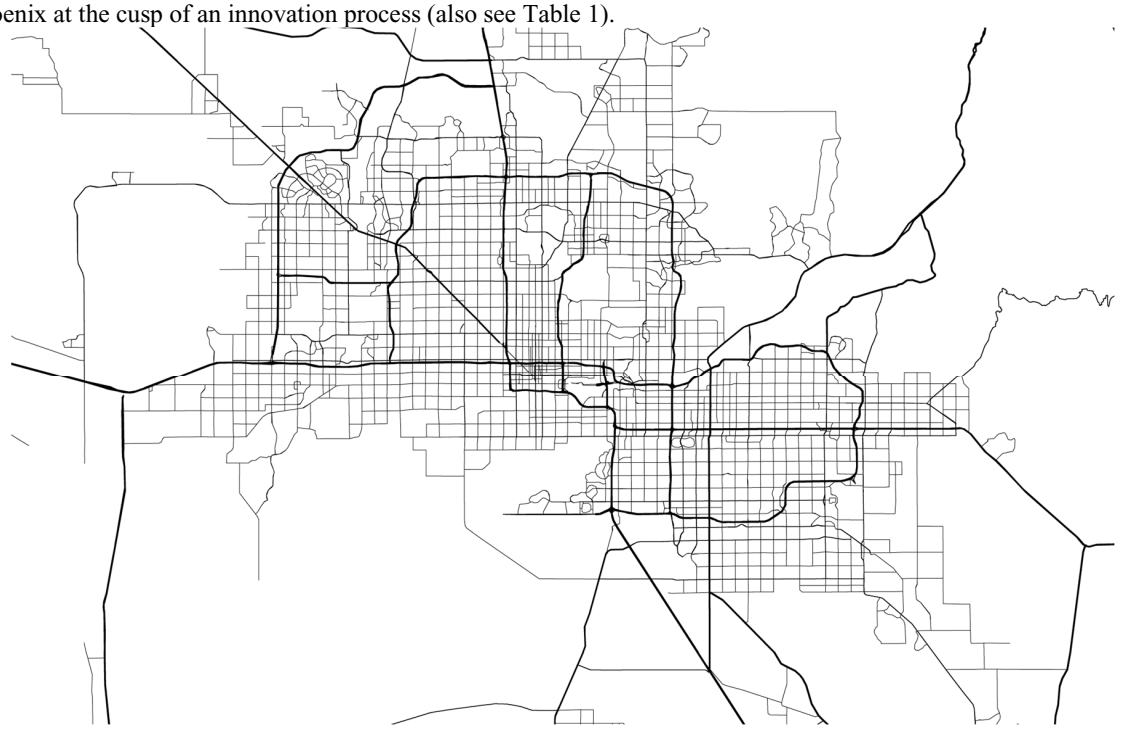

Fig. 2. Map of Phoenix, AZ (scale 1: 1,000,000)

2.3. *Comparing Groningen and Phoenix*

Tracing the process of innovation in both cases highlight a marked difference between the state at which both cases are situated. Groningen is of course, more established along this timeline, whereas Phoenix is just warming up (see Table 1). However, given that the comparison here is relative (i.e, the process per case) instead of absolute, there are still some similarities to be found.

Table 1. Comparing the timeline of critical events in Groningen and Phoenix (number of references).

Decade	Critical events (Groningen)	No. of references	Critical events (Phoenix)	No. of references
1970				
	Left-wing city council	3		
	Park-and-ride	4		
	Traffic Circulation Plan	6		
1980				
1990				
	The nineties	2		
2000				
	Akkord van Groningen	3	Temple Bicycle Action Group	10
			Light Rail	14
2010				

Let's Gro	3	Sustainable Communities Collaborative	5
Cancellation of Tram	8	Bicycle Coalition ASU	4
SAC Groningen	10	Capstone Projects	6
Urban Gro Lab	4	Bicycle and Pedestrain Committees	7
Cycling Strategy	7	New Integrated Cycling Infrastructure	4
Vigorous City Council	11	Bus (Rapid Transit) Network	4
2020			

The empirical data (coded) seeking conditions important to innovations to sustainable mobility reveals that both cases relied heavily on key actors and organizations (see Table 2). In Groningen, leadership of the political echelon was considered crucial while the presence of a dedicated local council was pivotal for Phoenix, AZ. The identified conditions are contingent to the state that the cases are in at present. The established planning culture (cultural institutions) of Groningen was frequently identified whereas in Phoenix, the reliance on societal norms and habits (social institutions) were more pronounced in relation to cultural institutions. Surprisingly, the economic development was overwhelmingly identified as important for Phoenix, AZ and this was not mentioned explicitly for Groningen.

Table 2. Important conditions identified for innovation process in Groningen and Phoenix, AZ.

Categories (see 1.3 for definitions)	Sub-categories	No. of references	
		Groningen	Phoenix, AZ.
Governance (coalitions)	Presence of coalitions	5	5
	Knowledge exchange/networking	5	-
	Grassroots activism	-	3
Governance (actors)	Leadership / Dedicated council	9	9
	Expertise and courage / presence of knowledge institutions	6	7
Cultural institutions	Trial and error approach	5	-
	Transparency in planning process	3	-
	Organic evolution of planning / Strategic long-term planning	3	8
Social institutions	Willingness of citizens/Community support	9	6
	Enthusiasm and passion	4	-
	Storytelling and best practices / proof	7	4
	Disaster contributing to awareness / Sense of urgency	5	4
	Marketing / Education	3	9
Others	Economic development (Financial)	-	14

2.4. Governance: Coalitions and collaborations

In Groningen, successes in sustainable mobility have been accredited to the close collaboration between actors. For example, the regional authorities, local transit authorities have close working ties with the local municipality (Regio Groningen-Assen, 2015). In addition, local knowledge institutes (universities, research centers) have signed an agreement with the city to collaboratively create an innovative city (Akkoord van Groningen, 2015). All large-scale infrastructural projects planned in the next decade are governed from Groningen Bereikbaar, a coalition of different levels of government, businesses and local citizens. The list of coalitions is almost endless, from demographic specific groups such as the Student Advisory Council (advises on traffic planning for the city from the viewpoint of the large student population) to think tanks such as Urban Gro Lab (comprises of local institutes and businesses collaborating with the city). Interviewees stressed the importance of knowledge exchange and networking in this transparent process. These collaborations are born out of a specific reason or urgency for parties involved such as the need to

consult each other regularly on regional infrastructural changes. The interviewees also indicate that there is power in collaborating, as they are able to send out a stronger message than in individual organizations. Collaboration with knowledge institutes also has the added benefit of enthusiastic students investing their time and energy to push these collaborations along. In addition, many found that the compact size of Groningen, resulting in a close social network, is conducive for such innovation processes.

In Phoenix, on the other hand, grassroots activism and coalitions between different actor groups are indicated as crucial. Though local agencies are committed to sustainable mobility in their recent plans, most of the impulse comes from bottom-up initiatives. Thematic grassroots groups (cycling advocacy) such as Phoenix Spokes People, Coalition of Arizona Bicyclists, and Bicycle Coalition ASU feature heavily in the process towards sustainable mobility. Although, recent institutionalized efforts such as Reinvent PHX (partnership between City of Phoenix, US Dept. of Housing and Urban Development, the university, and other organizations) have contributed as well. Here, the connection to residents is important for two reasons; i) active citizens are key users and advocate for sustainability, and ii) their involvement requires and creates an open environment for policy-makers and consultants. The bottom-up aspects of Phoenix's innovation process have created an organic development of sustainable mobility policies. Some believe that top-down implementation would not even work out.

> *"You will never succeed implementing to top-down sustainability because all these different cultures will never agree. Moreover, sustainability is seen as paying to limit the damage and not as creating new opportunities. So this will only succeed from the bottom-up. In cities you will succeed because people are closer connected and have something in common."* – Academic in Phoenix

Collaboration is also boosted through communication and networking. For example, the numerous council meetings, community events, and guest lectures contribute to storytelling and interaction between different actor groups. Collaboration across sectors and levels of government aids in the implementation of innovations in sustainable mobility for both cases. For example, the street design in Phoenix used to be a sole responsibility of engineers that had just the focus of accommodating cars. An extensive cycling network can however only be implemented when landscape designers and planners are involved. In addition, coalitions seem to have an importance in pushing for innovations, be it more lateral coalitions (government to government) or bottom-up (grassroots).

> "*To support sustainability goals you need coalitions…organizations that are comprised of leaders of other organizations representing different factors in a place that can rally around the cause, support it, and (put) pressure on local officials*" – Academic, Phoenix

2.5. Governance: Actors and organizations

Leadership of specific actors and organizations, as interpreted through political will or visionaries, is considered essential for innovations in sustainable mobility. The presence of a dedicated city council or left-wing city government or a sustainability champion in the form of a progressive mayor or sustainability director are repeatedly referred to in documents and by interviewees as being a key or pivotal condition in both cases. In addition, the expertise and courage amongst main actors and the involvement of environmentally aware students and local communities are contributing factors.

In Groningen, the left-wing city council in the late 1960s was considered a turning point and consecutive decision-making organizations (regional authorities, pro-cycling councils) are seen as the main engine of innovations. Strong leadership and political currency are key determinants for innovations in sustainable mobility. The implementation of the Traffic Circulation Plan in 1977 is a good example, of alternative transport planning strategies being implemented due to a visionary city council with the political power to get it through the planning processes.

"You need visionar(ies) in politics to guide the public opinion. To change is hard for people, especially in the city. So it is up to politics to activate the crowd and that requires a lot of courage. Democracy may be nice, but has its limitations as well." – Expert, Groningen (translated)

In Phoenix, leadership was also given prominent credit. In addition, the presence of knowledge institutes such as the Arizona State University plays an important role through cultivation of the progressive attitudes of its students who eventually play a role in planning practice. The students have a higher awareness for sustainability issue through their education and their socio-economic status does not always allow for car ownership. The situation of the campus within downtown Phoenix and Tempe are located near light rail stations, mixed-use and bike friendly, contributing to substantial change in commuter travel patterns and choices (Atkinson-Palombo and Kuby, 2011).

2.6. Cultural and social institutions

Cultural and social institutions in both cases differ due to the socio-cultural and political contexts of two separate nations. Local planning habits strongly affect policies and successes in innovations. In Groningen, the basis for innovations is present given the more established planning culture around sustainable mobility. In Phoenix, urgency for sustainable mobility is instead mostly motivated through social institutions with a bottom-up nature as a result of its conservative political culture. The process in Phoenix is therefore classified as at a starting phase. Given that sustainable mobility usually take a few decades to implement; both cases also indicate the necessity of an evolution in planning or at least the ability to do strategic long-term planning.

Groningen is perceived as conducive for new ideas and the trial-and-error is strongly accepted. According to the interviewees, the local planning agency believes in nurturing young talents and experienced staff. The civil organizations are flexible and intrinsically driven. The local authorities believe in an evolutionary approach to adopting innovations instead of sudden changes. Strategic plans and long-term visions are found being important to successfully pursue innovations. A visionary government, studies, evaluations, and a regional planning approach contribute to this pursuit. In addition, especially education about sustainability is seen as a meaningful method. This may help to overcome the lack of political and environmental awareness of a larger part of the population. Experts also underpin the importance of involving as many as possible stakeholders. Feedback from different actors contributes to stronger policies and puts pressure on local decision-making.

The willingness amongst citizens is important for Groningen. There needs to be popular support for the visionary. Implementation is contingent on good storytelling. Groningen is the Dutch cycling capital because it has 200,000 bike ambassadors in addition to its policies (van der Zee, 2015). A critical mass of ambassadors may also improve innovations by providing feedback. The enthusiasm, willingness, passion, and ability for storytelling amongst key actors were indicated as important as well.

"It can be frustrating that we [policy makers] always try our (hardest) best but that you still need a president or council member to successfully promote your story." – Policy maker, Groningen (translated).

Academics in Phoenix mention the importance of critical events that may raise awareness for sustainable mobility, such as fuel shortage, flooding, water shortages, or air quality problems. In addition, proved facts and best practice examples underpin political choices as well as provide insight in expected outcomes. Finally, active involvement of stakeholders including citizens plays a crucial role in the success of innovations. The presence of cycling groups and sustainability organizations are a contributing factor.

"The biggest trick is to let people try it once. Also for opponents, you see that if they try the light rail or bus once that they think it is a pleasant experience. Creating a personal message is therefore essential." – Planner, Phoenix.

Community support and willingness among citizens are indicated as important conditions for both cases. Storytelling, and best practice contribute to the innovation process. Enthusiasm and passion is more pronounced in

Groningen whereas in Phoenix, marketing and education are more emphasized. This is reflective of the stage at which both cases are situated.

3. Innovations for sustainable mobility

When tracing the process for innovation towards sustainable mobility in both cases, there are several categories of conditions that contribute greatly in both cases albeit with a slight difference, such as i) appropriate governance, ii) supportive institutions and iii) presence and context for collaborations and coalitions. Unsurprisingly, the planning process and desired implementation results are contingent on these three categories. Current literature also reminds us of the importance of appropriate governance and complementary institutions in processes of innovation (Clifford et al., 2005; Healey, 1998; Rietveld and Stough, 2005).

3.1. Governance: Where Top-down Meets Bottom-up

Unsurprisingly, the presence of strong leadership is highlighted in both cases as contributing to the process of innovation. The value of key actors or organizations in initiating, engaging and implementing innovations has been previously mentioned in other contexts (Banister, 2005a; 2008; Vergragt and Brown, 2007; Tan et al., 2014b). The dedication, expertise, and courage amongst key actors are seen as beneficial. They can take the form of a political champion, a visionary or even a progressive institute. For example, the sustainable mobility process in Portland has been strongly linked to the governor and congress representative in the 1960s (Tan et al., 2014a). The cases however, reveal the importance of having a strong following (or active citizens and lobby groups) in the innovation process. These 'early adopters' are crucial to building up a critical mass and can help in perpetuating the longevity of innovations. This is a key lesson that appears in the Groningen case, the presence of a nurturing environment for active citizens and coalitions. This might at times, require much change from established rules and regulations, as the planning process is historically hierarchical and institutionalized. The collaborative turn in planning provides excellent references of the complementarity in governance might occur (Brand and Gaffikin, 2007).

3.2. Institutions: Establishing norms and values

The institutions (formal and informal) are important elements that shape and form the local planning culture. The impacts of these planning institutions for sustainable mobility are mostly in the form of the working attitudes (trial-and-error, strategic long term planning and flexibility). The need for a conducive context (in accepting experiments of innovations) and a consistent (long-term) vision is well discussed (Banister, 2008; Hull, 2008 and Tan, 2013). A sense of urgency and ability to react to it are also crucial conditions as indicated in both cases. As Banister (1996; 2008) mentions, the presence of education and educational institutes are also important conditions. The raising of awareness, and continual expertise and training helps to perpetuate the sustainable development narrative. Clifford et al (2005) also affirms the importance of community support and the willingness of citizens. The process of community engagement through best practices and storytelling are meaningful in this process as well (Harris and Moore, 2013). Banister (2008) calls this 'selling the benefits'. The emphasis on behavioral and norm changes (informal institutions) is also common in other contexts (Banister, 2008; Tan et al, 2014a; 2014b). For example, current road design allocates proportionately more space for cars instead of pedestrians or cyclists regardless of modal split. This holds true in Phoenix, where streets are now seen as places instead of just thoroughfares. When comparing both cases and similar contexts around the world, the evolutionary approach (instead of abrupt changes or controversial policies) seems to guarantee success (Cervero, 1998; Curtis et al., 2009; Tan, 2013; Thomas and Bertolini, 2013).

3.3. The value of coalitions

Last but not least, both cases illustrate clearly the initiating role (Phoenix) and perpetuating character (Groningen) of coalitions, especially those that are motivated by bottom-up or local activism. The collaboration between established organizations and local initiatives plays an important role in the process of innovations for sustainable mobility. Knowledge exchange and networking contributes to the sharing of innovative ideas and provides political

leverage (Cross et al., 2013). Moreover, these coalitions, both temporary and permanent, fill a void between institutions that are slower to change and that of dynamic socio-cultural values (Marsden et al., 2014). Therefore, they are crucial for the pursuit of sustainable mobility.

In conclusion, the process of innovation to pursue sustainable mobility can occur with certain conditions where there are appropriate governance structures in which the top-down policies can accommodate bottom-up energies and desires. For example, in a car-oriented planning culture, the presence of cycling activists groups can be a huge force forwards, as in the case of Phoenix. The presence and flexibility of institutions (planning culture and social norms) are complementary conditions that can encourage this innovation process. The planning culture in Groningen, which is more prone to trial-and-error and open to experiments, becomes a nurturing environment for pursuits of sustainable mobility. Between the negotiation of current governance structures and transference of institutions, lies another crucial condition - the role for coalitions. In Groningen, the Student Advisory Council has a networking role between a certain demographic of users whose needs need to be reflected in planning procedures but are not necessary institutionalized. Coalitions have a two-fold purpose, to invigorate discussions with an alternate point of view as shown in Phoenix or to perpetuate the sustainability discussions as in both cases.

The policy lessons that can be taken from Groningen and Phoenix are that when it comes to innovation processes and sustainable mobility, policy should give room for alternate voices in the form of coalitions. Citizen and community engagement do not necessary need to lead to negative impacts (i.e, NIMBYism) but can have a positive contribution when properly utilized and involved (Boelens and Boonstra, 2011).

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